NMR&D News

Navy Medicine Research and Development

Volume II, Issue 1
January 2010

Navy Surgeon General Visits NAMRU-3

By Darnell Gardner
NAMRU-3 Technical Writer

Vice Admiral Adam Robinson, Navy Surgeon General (SG), visited U.S. Naval Medical Research Unit No.3 (NAMRU-3), Cairo, Egypt December 10-11 after attending a Pan-African conference in Botswana. During his visit at NAMRU-3, the SG was presented with a brief on the command's history and activities by CAPT Kenneth Earhart, Commanding Officer, that was attended by department and program heads, and followed with a tour of the command. Vice Admiral Robinson summed up his visit by stating, "The work you do here is a real service to the Navy, the United States, and the world."

Photo by CDR Surrette, SG PAO

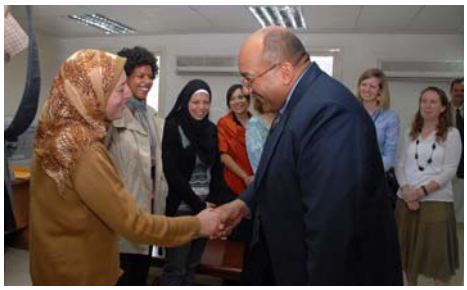


Photo by Mr. Rafi George

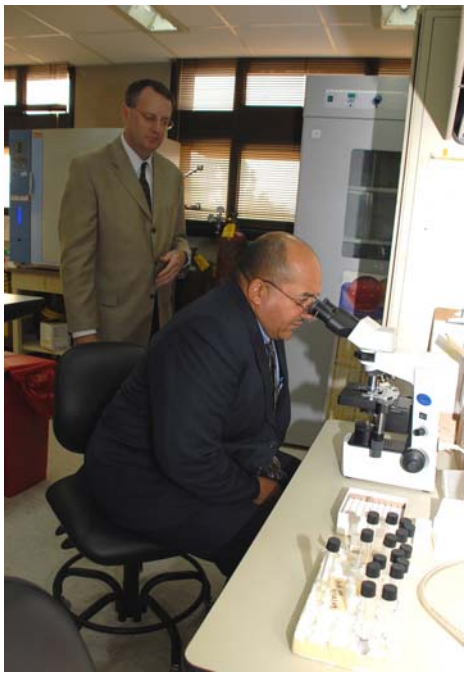
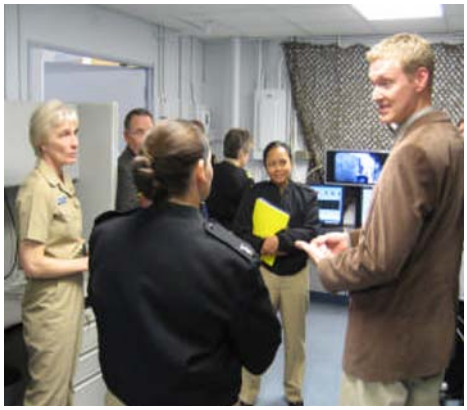


Photo by Mr. Rafi George

RDML Eleanor Valentin Visits NAMRL, Tours Facilities and Labs

By Larry Schoenberg
BRAC Manager

RDML Eleanor Valentin of the Navy Medicine Support Command (NMSC) and Chief, Medical Service Corps, visited the Naval Aerospace Medical Research Laboratory (NAMRL) on December 7, 2009. It was RDML Valentin's first opportunity to visit one of NMRC's subordinate laboratories. NAMRL's Officer in Charge, CDR Rita Simmons, and senior staff presented a command overview on NAMRL's mission, current research programs, product lines and technology transfer accomplishments as well as BRAC plans and major milestones. RDML Valentin toured the facility and its laboratories and received a first-hand look at how NAMRL supports the fleet and warfighter mission. RDML Valentin emphasized the importance of the research conducted at NAMRL and all the Navy Medicine laboratories she has visited. RDML Valentin and her staff intend to market the operational medicine research enterprise and increase visibility at both BUMED and in the Fleet.



RDML Valentin touring NAMRL's hypoxia lab

NHRC Scientist in *People* Magazine

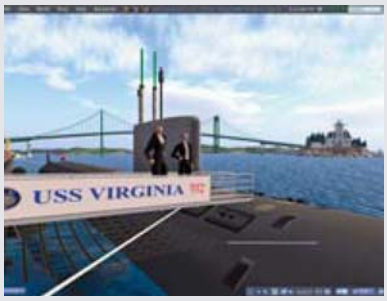
People Magazine recently recognized Naval Health Research Center scientist CDR Patrick Blair, who led the Navy team that detected the first U.S. cases of H1N1 influenza and identified the H1N1 virus in April 2009 . "You see this stuff for the first time and you get shivers," CDR Blair is quoted as saying. The piece was included in the December 28, 2009 year-end issue on the people and events that had the greatest impact on the nation in 2009. The photograph on the right depicts CDR Blair (left) with CDR Dennis Faix, a member of the NHRC team that identified the H1N1 virus.

Naval Undersea Warfare Center Showcases Capabilities

The Naval Submarine Medical Research Laboratory was highlighted in an article featured in "Show Daily" on Day 2 at the Inter-service/Industry Training Simulation Education Conference (I/ITSEC) held in Orlando, Florida November 30 through December 3, 2009. The article is reprinted with the permission of I/ITSEC.

The U.S. Naval Undersea Warfare Center (NUWC, Booth 1163) has brought together a number of different partners and programs on its booth this year at I/ITSEC. The aim, according to Gary E. Streimer, Mission Capability Manager Undersea Warfare Training, is to show how NUWC is focusing on the technology in the undersea modeling, simulation and training area.

NUWC Newport and Keyport have been joined on the booth by the Naval Submarine Medical Research Laboratory (NSMRL), Submarine Learning Center, Program Executive Office (PEO) NAVSEA and PEO Integrated Warfare Systems to show how they are assisting modeling and training in the undersea environment. The theme of the booth is 'Operational Excellence Linking Training, Simulation and Virtual Environments.'



A full quarter of the NUWC booth is given over to examples of how the organization is looking to harness virtual worlds for both training and collaborative working. Steven Aguiar, Metaverse Exploration Project Lead, says that NUWC is very interested in how virtual world technology can be utilized.

NUWC is one of several agencies that have built campuses within the popular Second Life virtual world developed by Linden Lab. According to Aguiar the web 2.0 social tools available in Second Life and other virtual worlds give the opportunity for real-time distributed collaborative working. "For example you can build engineering models within these worlds that people in different locations can use to work collaboratively," states Aguiar.

The center is not relying on Second Life alone to provide these kinds of virtual world capabilities. In order to collaborate on more sensitive issues NUWC has also developed various virtual worlds behind its firewall. Aguiar said that his team had demonstrated how avatars could control real-world hardware using virtual world controls.

Another area being highlighted by NUWC and its partners is the use of simulation and modeling to better understand the requirements of undersea operations. Jerry Lamb, Technical Director at NSMRL, says that submarines are one of only two environments that impose such difficult human performance and physiology challenges— the other is aboard the international space station.

Lamb said that modeling and simulation could be used to better understand these challenges. NSMRL is building up data modeling that can then be fed into various submarine models to understand the issues.

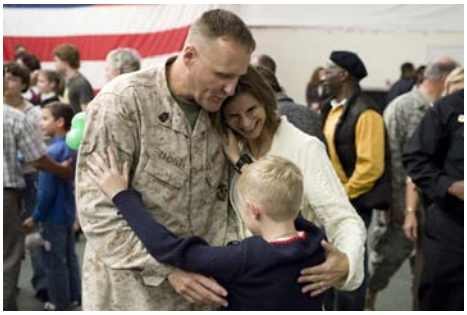
Elsewhere on the booth is the Submarine Learning Center. The center has the primary function of creating, coordinating and executing the future training and education vision for the Submarine Force. The center's personnel are showing how they are meeting the training challenges of the submarine force.

Post-deployment User's Guide: A Transition Workbook for Veterans

By Dr. Valerie Stander
Research Psychologist, NHRC

While there is a high level of concern among political and military leaders for the well-being of all service members, this concern is heightened further when service members are deployed to combat. Deployment involves unique risks and stressors and places burdens on families that extend beyond the problems associated with geographical separation. Moreover, combat deployment is a significant risk factor for psychological distress. Yet many service members may not be willing to seek professional help. Others may need guidance, but not clinical assistance. To increase the types of resources available to combat veterans, Dr. Valerie Stander and her colleagues at the Naval Health Research Center (NHRC) developed the Post-deployment User's Guide (PUG) .

The PUG offers simple activities and practical information in twelve content areas including goal setting, personal growth, personal thoughts, personal relationships, mental health, grief and guilt, recreation and relaxation, physical health, substance use, finances, career, and legal affairs. The organizing theme is goal-setting, including worksheets and tools to help returning veterans set new short-term goals and work to achieve them. The PUG includes information regarding how to seek professional assistance as well as several assessments to help veterans gauge whether professional help might be best for them. Nevertheless, the PUG primarily includes information helpful in facing common challenges that all veterans



Department of Defense photo

Continued on page 6

Commanding Officer's Message

Researchers, Support Staff and Stakeholders of Navy Medical Research, Development, Testing and Evaluation (NMRDT&E):

The holidays have passed, but I want to wish you a belated Happy New Year. It's not too late to reflect on our accomplishments of 2009 and the last decade and to look at the challenges that are upon us as we begin the second decade of the 21st century.

Our lives were forever changed on the morning of Sept 11, 2001. Evil raised its ugly head and unleashed horror on the innocent. Anyone who travels is reminded every time they go to the airport or board an airplane. Two wars have since ensued and even though one may come to an end in 2010, it is hard to predict the plans of those who seek to destroy our way of life.

All of us should be proud of Navy Medicine Research and Development's response to the needs of our warfighters and our nation. It would take too much space to describe every contribution, but over the last decade, we:

- Identified or detected new pandemic viral zoonoses that are a threat to the world (H1N1, H5N1)
- Responded to our national leadership to detect and identify intentional biological threats to our national capital region and beyond
- Developed and tested a new endodontic tooth treatment and far-forward dental dressing
- Developed fatigue and motion sickness countermeasures
- Developed strong collaborative relationships to build disease surveillance and public health capacity at our host nations and surrounding countries in South America, Southwest/Southeast Asia and the Middle East
- Devised new strategies for surgical interventions and follow-up care/wound management
- Made significant advances in disabled submarine survival research
- Tested and fielded a transportable field ventilator
- Provided humanitarian assistance after the Southeast Asia tsunami and earthquake in Peru
- Developed extensive DoD health surveys and databases such as the Millenium Cohort Study to document and further our understanding of disease and injuries
- Advanced several promising malaria vaccine candidates to successful clinical trials.

In the year that lies ahead, we will further cement our new R&D Enterprise as we "stand up" new Commands, disestablish several detachments, further embrace clinical research coordination and consolidate our Enterprise into a high-performance organization focused on providing medical solutions to our warfighters and our healthcare beneficiaries. With the use of nanotechnology, genomics, proteomics and bioinformatics, we will continue to make significant contributions in the future. Our "raison d'etre" is to facilitate the Navy's medical and health research mission for the betterment of our Navy and Marine Corps, DoD and our country. Know that your contributions to our mission are appreciated and we are all very proud of the work our medical research enterprise does. Now let's get ready for the challenges of the new year and the decade ahead.

Commanding Officer sends,
Richard L. Haberberger, Jr.
CAPT, MSC, USN

NAMRU-San Antonio Bids Farewell to its F/A-18A Hornet

By Mr. Randal K. LeBlanc
and Dr. John D'Andrea

On November 6, 2009, the Naval Medical Research Unit-San Antonio (NAMRU-SA) bid farewell to a familiar fixture at the command for thirteen years, the F/A-18A Hornet. Bureau Number 1624473 from the famed U.S. Marine Corps "Black Knights" squadron featured in the 1996 sci-fi thriller "Independence Day" has been reallocated by the National Museum of Naval Aviation to the Texas Air Museum in Lubbock. The F/A-18A Hornet has been a trademark of the Navy's presence within the Tri-Service Directed Energy Bioeffects Complex and played a major role in helping set new safety standards related to radio frequency (RF) induced body current. The F/A-18 research efforts ended a few years ago, and with NAMRU-SA preparing to relocate to Fort Sam Houston, Texas in March 2011, it was time to say goodbye and "BRAVO ZULU."

For over ten years, research studies have been conducted at NAMRU-SA to evaluate RF effects on the human body. These studies were important because radio communications and

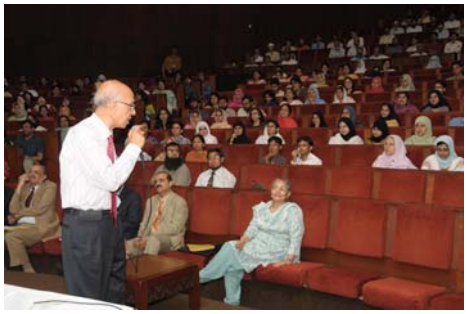
Continued on page 4

NAMRU-SA F/A-18A on the simulated aircraft flight deck.

NAMRU-3 Promotes Lab Safety in Pakistan

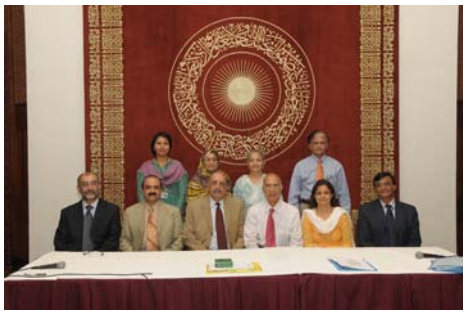
By Darnell Gardner
NAMRU-3 Technical Writer

Navy Medicine supports the increased partnership between the U.S. and Pakistan through health diplomacy focused on laboratory safety. Bio-Safety/Security concerns rank high with the Pakistan Bio-Safety Association (PBSA) and at the Aga Khan University (AKU) Hospital, which is why U.S. Naval Medical Research Unit No. 3 (NAMRU-3) was called upon for assistance. With support of the Department of State Bio-Engagement Program (BEP), NAMRU-3 researchers assessed bio-security needs and implemented programs to determine capacity requirements for Pakistan. To date, there are two Bio-Safety Level 3 (BSL-3) laboratories, one located at AKU Hospital and one in Peshawar. One will be used for research and diagnostics for *tuberculosis* and the other for the detection and characterization of *V cholerae*. Key German health officials are also engaged with PBSA and have pledged their support to ensure the laboratories' success.



Dr. Zaki at briefing in Karachi

The head of NAMRU-3's BSL-3 Laboratory Technical Consultation Team, Dr. Adel Zaki, traveled to Karachi in March 2009 to participate in a bio-safety/bio-security seminar that focused on BSL-3 awareness and facility design criteria. In a follow-up workshop at Aga Khan University in Karachi, Mr. Zaki led a second seminar on laboratory bio-safety and presented



PBSA officers with guests and presenters

briefings to laboratory managers, technicians and maintenance engineers. Emphasis was placed on the need to have upper-level management fully engaged and dedicated to ensure the success of laboratory programs.

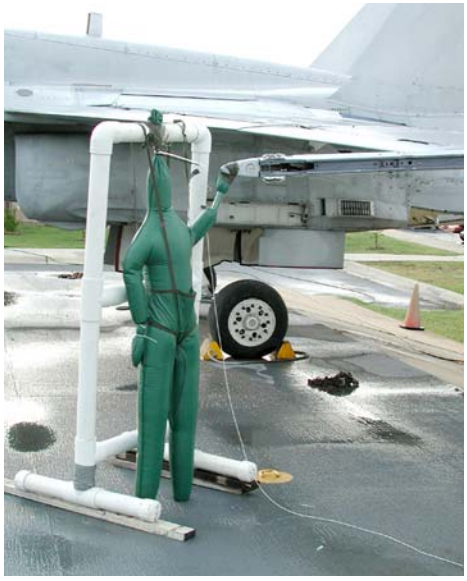
NAMRU-3 plans to support the establishment of AKU as a regional hub for the detection and characterization of *V cholera* in the region. To this end, the PBSA is planning future cooperative projects to have NAMRU-3 conduct additional workshops on the operation, maintenance and management of laboratory facilities.

F/A-18A Hornet

Continued from page 3

radar are used extensively on Navy ships. Onboard air-capable ships, aircraft are stationed near high-frequency (HF) antennas radiating in the 3-30 MHz frequency range for ship-to-ship communications. It has been observed that aircrew touching the aircraft experienced wrist and ankle warming. Research personnel at NAMRU-SA were aware of this heating phenomenon, but it was difficult to study due to limited access to shipboard aircraft and personnel. LT Randal LeBlanc, then Officer in Charge, Naval Medical Research Institute, Brooks Air Force Base, Texas, solved this problem by arranging for the loan of an F/A-18 aircraft frame and moving it to a simulated flight deck at Brooks in 1996. Research studies were then conducted using the F/A-18 aircraft frame with HF antennas installed on the simulated flight deck and a human model nicknamed "Green Man," a green sewn-bag figure filled with a water-based substance that simulates human tissue and muscles. The research showed that HF antennas do induce current flow in the human body and that flight deck personnel making contact with aircraft while loading ordnance or preparing for catapult launch become a conduit for this energy. Induced current can be above the recommended exposure level as allowed by Department of Defense RF exposure guidelines (DoDI 6055.11). Little was known about the level of HF current flow in the human body in this frequency range until the NAMRU-SA studies were conducted. Based on these studies, the concept of time-averaged exposure was evaluated and shown to be a good mediator of the induced currents. This data directly contributed to the establishment of a 500 mA induced current limit in the Institute of Electrical and Electronics Engineers safety standard, "IEEE, Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1). Under this standard, aircrews limit their direct body contact with the aircraft, thus reducing the level of induced RF currents.

Unfortunately, there is no interest in performing further research into RF-induced body current onboard ships since the questions have been answered and the standards established. The decision was made to make the F/A-18A Hornet available to a museum for the enjoyment and reminiscence of aviation enthusiasts.



"Green Man" induced RF current experiment. Photo by Barry Van Matre.

NSMRL Develops Test to Detect Hearing Loss Risk

By Dr. Judi Lapsley Miller
NSMRL Research Consultant

A new ear test under development by the Naval Submarine Medical Research Laboratory (NSMRL) will reduce the rate of noise-induced hearing loss. The test not only detects people who are more susceptible to noise-induced hearing loss, it also detects the early signs of hearing loss long before it shows up on the usual hearing test (an audiogram).

The test takes only minutes to perform. The tester places a tiny foam-covered speaker and microphone into one or both ears, much the same as putting in an earplug. Sounds such as tones, chirps, clicks, and static are played softly into the ear. Unlike regular hearing tests, the person being tested does not have to indicate that he or she heard the tone. Instead, the microphone records the sounds the inner ear makes in response.

These inner-ear sounds are called *otoacoustic emissions*. They are made by healthy ears and are strong enough to be recorded in the ear canal with a sensitive microphone. The cells in the inner ear that generate these emissions are some of the first to be damaged by hazardous noise, so ears with noise damage tend to make fewer, smaller, or even no emissions.

Researchers at NSMRL have tested hundreds of ears with normal hearing, before and after hazardous noise exposures. Navy sailors on a six-month deployment and Marine recruits during basic training were more likely to sustain a hearing loss if they had low-level or no otoacoustic emissions before exposure to hazardous noise levels. Ears with the lowest otoacoustic emissions were nine times more likely to sustain a hearing loss.

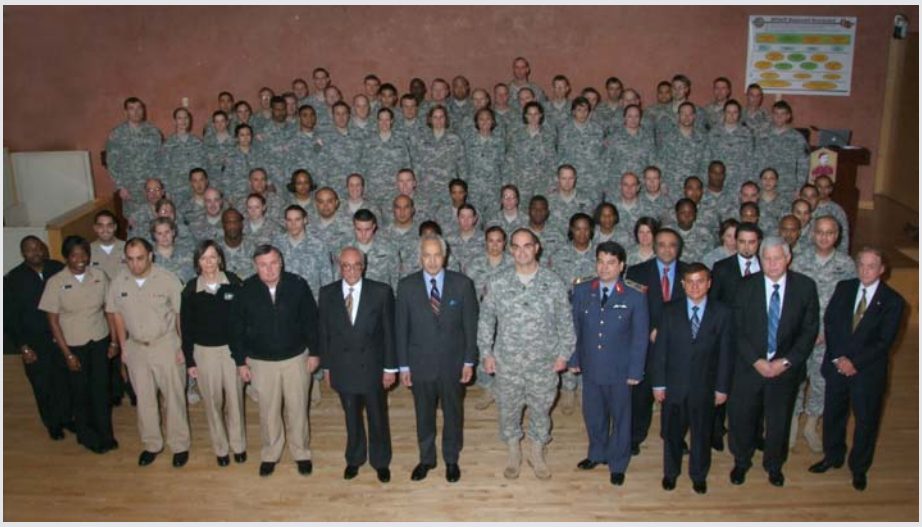
Otoacoustic emissions can also be used to measure the strength of a hearing-system reflex. The stronger the reflex, the more protection there is from noise. So far, this test has only been verified in animals. NSMRL researchers expect that the test will also be effective in human ears and are currently running experiments to find settings that are sensitive to the reflex and are clinically practical to administer.

A sailor receiving a prototype otoacoustic emissions test

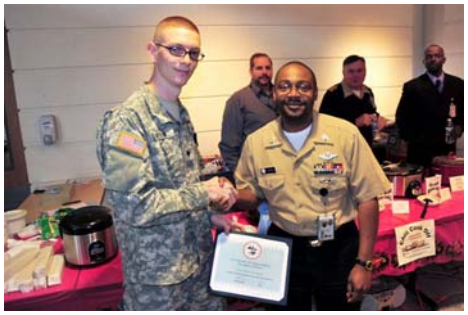
The new test could improve hearing-conservation program efficiency. Once susceptible personnel have been identified, resources can be focused where they will do the most good. Those more at risk for hearing loss could receive individualized attention, whereas those less at risk could be monitored less frequently. The addition of a new test will not increase test time significantly because the same equipment can also be used to perform the regular hearing test.

WRAIR Distinguished Speaker Series Features Former Advisor to Saddam Hussein

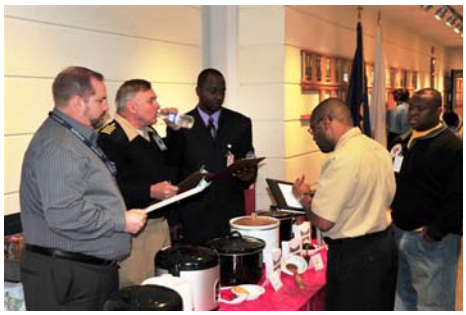
Dr. Jawad M. Hashim, former Minister of Planning and Advisor to Saddam Hussein, discussed the past, present, and future of Iraq at the Naval Medical Research Center (NMRC)/Walter Reed Army Institute of Research (WRAIR) on December 16, 2009 as part of the WRAIR Distinguished Speaker Series. In May 1982, Dr. Hashim defected to Canada with his wife and two sons, where they obtained Canadian citizenship.



NMRC Chili Cookoff



First place winner PFC Wade Bryan (left) and HM1 George Odom (right), who took second and third place for two different chilis.



The judges sample the various chilis.

Happy New Year from the NMRC Ombudsman!

I would like to wish everyone a very Happy New Year and welcome everyone back from what I hope was a restful and recuperative holiday season. Hopefully, we have all returned ready to make 2010 a very fulfilling and successful year, both in our personal and professional lives.

SOAR at Home

As adults in the military, we get used to moving and adjusting our lives when called to do so. We have to remember it is not so easy for our children to transition from school to school and always keep up with their studies. The Students Online Achievement Resources (SOAR) program is a partnership between Military Impacted Schools Association, The Princeton Review, SkillsTutor, and The University of Northern Iowa to assist with the unique challenges of military children as they move from one school to another. SOAR is an online program tailored to meet the standards of individual state education systems. Your child can focus on math, reading and language arts and identify strengths and areas of needed improvement. The program is modified for the specific needs of the student and will help whether they are just moving to a new school or have been in the same school for many years. Check out ww.SoarAtHome.org for more information.

It's Never Too Late for a Care Package

Care packages aren't just for Christmas or birthdays; they are appreciated any time of the year. Be creative – send a New Year's day, Valentine's day, or "just because I was thinking of you" package. Share what you did during trips you have taken – pictures, trip souvenirs, etc. Or create a 2010 calendar with a theme. Put pictures, quotes or messages on various dates.

Tired of sending those useful but somewhat boring packages with baby wipes, shampoo and chapstick? Those items are needed and wanted, but to "jazz" it up a bit, come up with a theme. If a post-holiday cheer or New Year's theme isn't quite right, then try something else. It isn't hard to find practical items with a "theme" and it's easy to expand the theme to music, books and magazines.

Don't forget to share your day-to-day life. Pictures from friends and family will mean the world to your Sailors!

Check out the United States Postal Service Guidelines on sending packages to our troops overseas: http://www.usps.com/supportingourtroops/welcome.htm.

If you need more information on these resources or any other resources, please feel free to contact me at angela.prouty@med.navy.mil or 217-722-4981.

Angela Prouty
Ombudsman, NMRC

NHRC's Post-deployment User's Guide

Continued from page 2

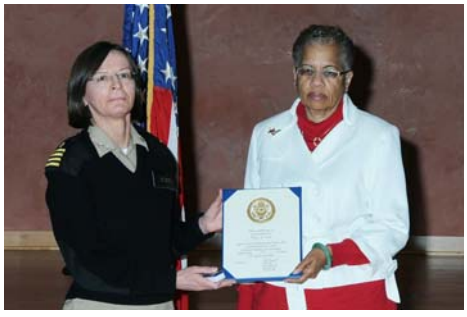
might deal with during post-deployment adjustment.

A number of professional and online resources are available for returning veterans who are experiencing difficulty adjusting. However, this project was conceptualized from a positive psychology perspective as a hands-on guide to personal growth upon returning from deployment. The PUG takes into account the fact that multiple aspects of personal and professional life influence psychological resilience. While exposure to combat is a profound experience, the trajectory of post-combat life can take many directions depending on the strength of one's relationships, one's mental perspective on war experiences and many other factors addressed in the workbook.

The Marine Corps plans to distribute NHRC's post-deployment workbook as part of their Warrior Transition Programs. Dr. Tom Gaskin, Director of Combat and Operational Stress Control for the Marine Corps, requested 100,000 copies of the workbook for distribution to Marines.

Best Retirement Wishes, Paula Kirk!

NMRC Executive Officer CAPT Eileen Villasante congratulates Paula Kirk, a financial manager in NMRC's Resource Directorate, who recently retired after a career spanning more than 30 years.



NMR&D News

is an authorized publication of the Naval Medical Research Center, 503 Robert Grant Avenue, Silver Spring, Maryland, 20910. *NMR&D News* is published monthly by the NMRC Public Affairs Office. Please contact the Public Affairs Officer at 301-319-7581 or svc.pao.nmrc@med.navy.mil with questions or to submit an article.

Commanding Officer
CAPT Richard L. Haberberger, Jr.
Executive Officer
CAPT Eileen Villasante
DFA - Public Affairs
CDR Eric R. Hall
Editors
Soni Fitzhugh and Jan Helman